REMARKS

Applicant has added new claim 26-31 and cancelled claims 1-12, 14, 16 and 24. Claims 13, 15, 17-23 and 25-31 are pending in this application.

On October 29, 2004, Applicant held a personal interview with Examiner Fineman and Examiner Robinson. Applicant demonstrated a prior art type zooming system for a microscope and the zooming system according to the present invention. Applicant then explained the differences between the two zooming systems. No agreement was reached with respect to the claims.

The Examiner rejected claims 13-15, 17-21, 23 and 25 under 35 U.S.C. Section 103(a) as being obvious over Admitted Art in view of Nagashima (US Patent No. 5742735) and Sarfaty (US Patent No. 5741171). Applicant has amended the claims to more clearly distinguish the present invention. Based on these newly amended claims, Applicant respectfully traverses the rejection.

The present invention according to claim 13 will now be explained, by way of example, with reference to FIG. 2 of the present specification. The first and second moving lenses L1 and L2 are independently controlled by direct driving motors LA1 and LA2, respectively. The motors LA1, LA2, in turn, are controlled by a control unit AE. These motors are very precise motors that have step-wise resolution. In other words, each step in a turn can be controlled for very precise movement of the lenses. Based on a mathematical controlling curve which defines the position of the two lenses at every zooming position, a control unit knows exactly how many steps are needed for each motor to obtain a particular zooming position.

For example, let's assume that a user has elected to move the lenses currently at 10X to 15 X. The mathematical curve indicates that LA1 needs to move 50 steps while

LA2 needs to move only 25 steps because their curves have different slopes. Further assume that the zooming speed selected by the user is 5X per second. In that case, the control unit independently directs the motor for LA1 to move 50 steps per second and for LA2 to move 25 steps per second. In other words, the two motors are directed to move at different speeds determined by the control unit according to the mathematical curve. It is important to note that while the two lenses are moving, they will always be at correct zooming position (thus correct focusing position). This feature is recited in claim 13 as "each direct driving motor having a step-wise resolution" and "a control unit operable . . . simultaneously directing the movement of the first and second moving lenses by controlling the driving motors in a corresponding manner *to cover a different number of discrete individual steps per unit of time according to the mathematical controlling curve*" (emphasis added).

No new matter is added as this feature is supported in the specification at page 3, lines 25-30.

The Nagashima reference is cited by the Examiner for teaching a driving unit including driving means and a control unit which reads calculated pre-stored values of reference points from a mathematical controlling curve for directing the movement of the lens system. The Examiner then asserts that the drive unit of Nagashima can replace that of the Admitted Art. Applicant respectfully disagrees.

Nagashima teaches curves for the movement of the lenses in FIG. 2; for each value of the zoom magnification, there is a position that defines where the lens groups 1 and 2 have to be. Nagashima, however, does not teach or suggest how the movement is accomplished, except to state that the movement is along the tracking curve.

To move a lens via a motor, one of ordinary skill in the art would understand that the following steps are performed within the driving circuit:

1. calculate distance to target position;

2. start motor (motor accelerates);

3. control position (motor is being driven at constant speed);

4. when the target position is nearly reached, slow down the motor; and

5. stop at target position.

With the above procedure, the two lenses may reach their target position at different times due to the nonlinearity of the curves for the two lenses, difficulty in controlling the motors and possibly constant speed of the motors.

Again using the example above, under Nagashima, moving L1 from 10X to 15 X may take longer than moving L2 from 10X to 15X because the distance covered by the first lens is twice as great as that of the second lens.

This is especially true when the slopes of the two curves (e.g., I_1 and I_3 in Nagashima) are very different from each other. Therefore, while the lenses are moving, the two lenses may not satisfy the mathematical curves, leading to slight blurring of the object being filmed. For a video camera, this is not a problem since the user cannot distinguish the blurring from the visual impression. However, this solution cannot be used in controlling a microscope with its much higher optical properties.

According to the invention, the control unit can precisely control the steps of the motors and can move the lenses at different speeds (by varying the number of steps per unit of time) to accomplish precise zooming positions during movement of the zooming lenses. This is not taught or suggested in Nagashima.

The Examiner cited Sarfaty for the proposition that a direct linear drive motor is well known in moving lenses. However, Sarfaty does not teach or suggest a control unit that can operated two motors at different speeds (steps per unit of time) to achieve

precise zooming position during movement of the lenses. Thus, the cited references, either individually or in combination, do not teach or suggest the novel combination as claimed in claim 13.

Dependent claims 15, 17-21 and 23 are also patentable by virtue of their dependency from independent claim 13.

The Examiner rejected claim 22 under 35 U.S.C. Section 103 under Admitted prior art in view of Nagashima and Sarfaty and further in view of Pensel (US Patent No. 5867308). Applicant submits that claim 22 is also patentable by virtue of its dependency from claim 13.

Applicant has amended claim 25 to recite the feature that the control unit is "operable to perform an initialization of the first and second direct driving motors to find a predetermined position upon power-up". None of the cited references teach or suggest such a novel combination.

Applicant also submits that dependent claims 26-31 define patentable subject matter.

Based upon the above amendments and remarks, Applicant respectfully requests reconsideration of this application and its earlier allowance. Should the Examiner feel that a telephone conference with Applicant's attorney would expedite the prosecution of this application, the Examiner is urged to contact him at the number indicated below.

Respectfully submitted,

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